

Project Readme

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Project Summary:

The "coupons" dataset was analyzed using pandas and other standard packages. This analysis extracted meaningful information, providing a better understanding of the data and aiding in the prediction of future customer behaviors based on observed patterns.

Steps used to extract and visualize (reference to CRISP-DM)

1. Business Understanding:

- a. **Project Scope:** The project involves importing and analyzing data provided in CSV format.

2. Data Understanding:

- a. The `coupons.csv` file was imported as a CSV.
- b. A sub-dataframe containing specific columns was created for particular use cases.

3. Data Preparation:

- a. The dataframe was thoroughly checked for null values, incomplete strings, missing data, and incorrect data types. No deviations or misalignments were found.
- b. The `.index` was incorporated to improve the accuracy of the `.count()` function.
- c. Wherever needed, the following functions were used to validate incomplete data
 - i. `.isnull`
- d. Some columns were dropped as they were not relevant for this specific use case.

4. Utilizing standard libraries for data extraction and visualization.

- a. 'pandas', 'numpy', 'Matplotlib', 'seaborn', and 'plotly.express' were used.

5. Hypothesis: An initial assessment was conducted using a subset of coupon usage data specifically for 'Bar' locations, revealing the following inferences:

Key Observations on Bar Coupon Usage:

- **Gender Neutrality:** Coupon usage for bars is equally distributed between males and females.
- **Offer Rate:** Bar coupons represent approximately 9% of all coupon categories offered.
- **Low Redemption:** Despite being offered, bar coupons are the least frequently used category.
- **Temperature Influence:** As temperatures rise, the redemption of bar coupons increases.
- **Loyalty Paradox:** Frequent bar visitors (more than four times) tend to utilize fewer coupons.
- **Demographic Contribution:** Unemployed individuals, students, and sales professionals

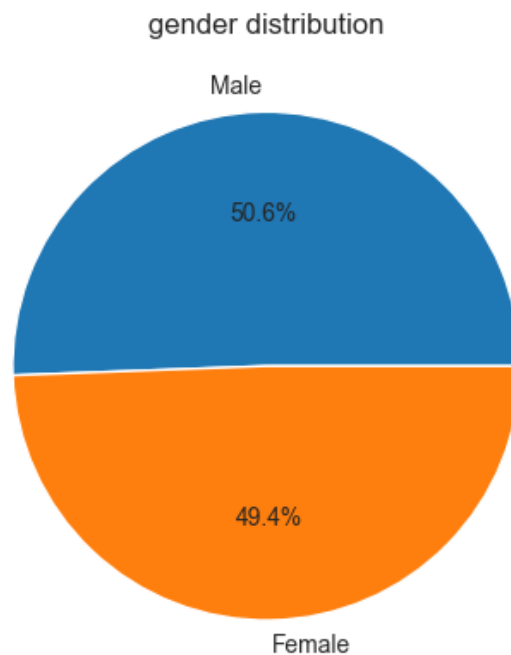
collectively account for about 35% of all bar coupon redemptions.

- **Marital and Age Demographics:** Divorced individuals and unmarried partners in the 31 to 46 age group show a higher propensity to use bar coupons.

Visualization:

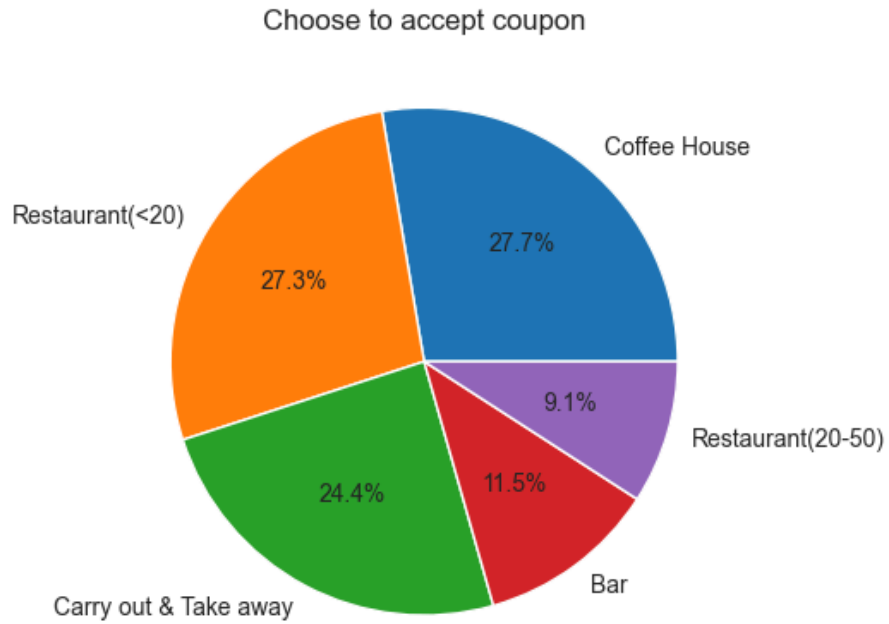
1. Name: Bar coupon usage by gender

- a. Library Used: matplotlib
- b. Inference: Both genders equally use coupons at bar.

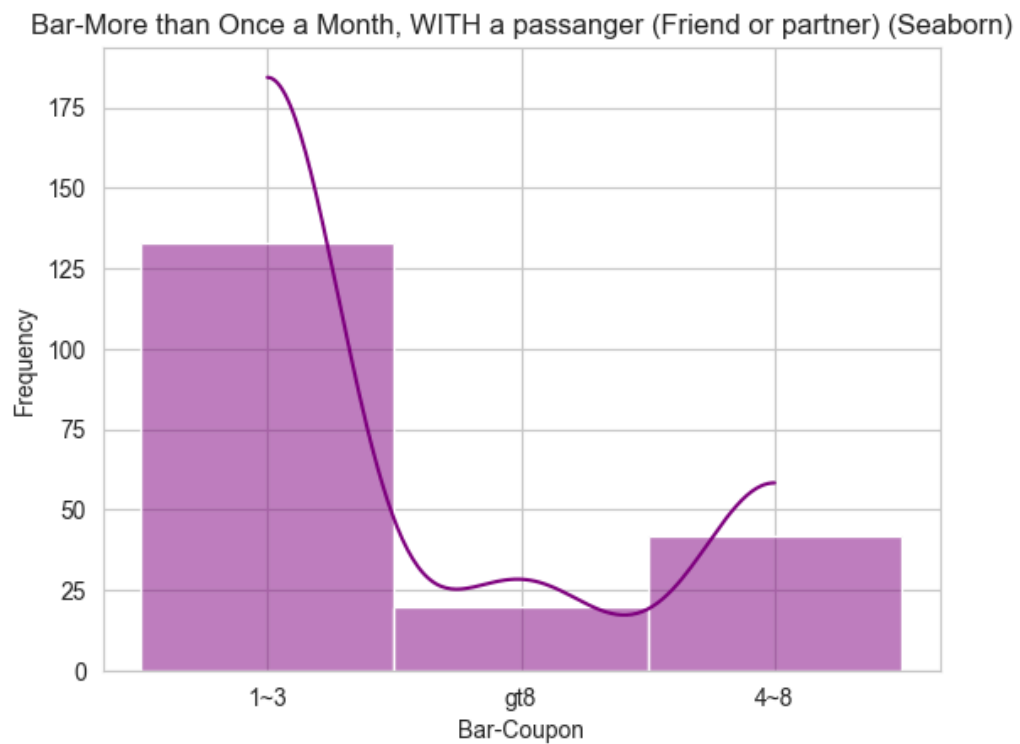


2. Name: Coupons by distribution of restaurants / bar

- a. Library Used: matplotlib
- b. Inference: Coffee House and Cheap restaurants (Less than \$20) occupy more than 50% of usage.



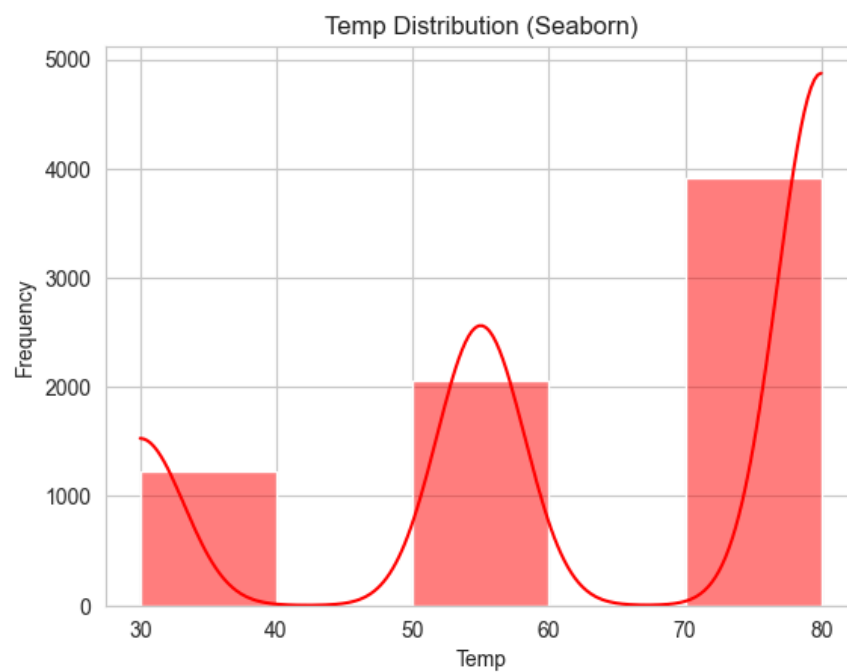
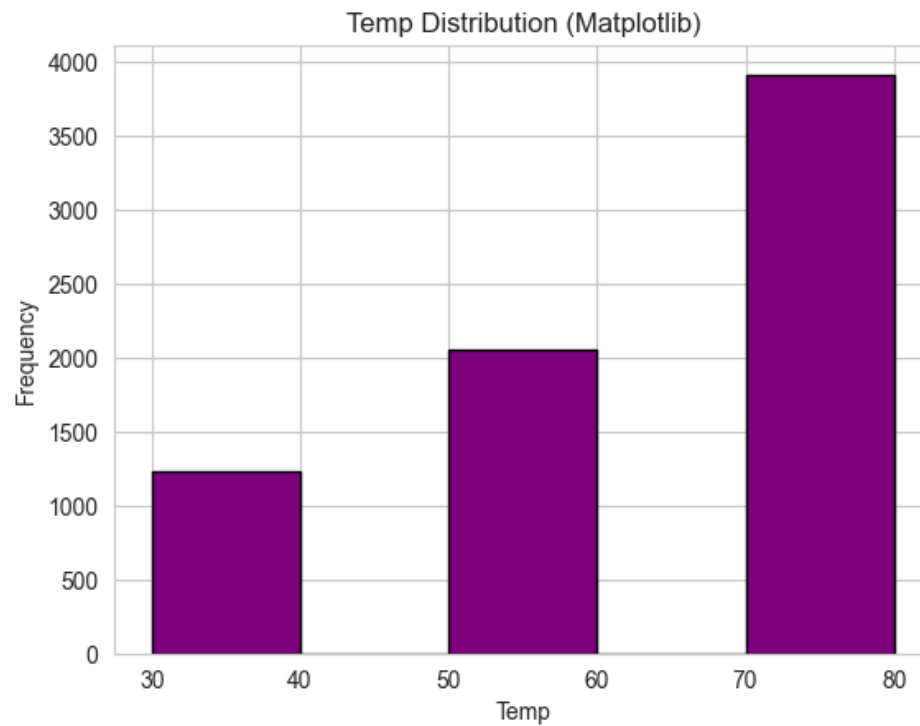
3. **Name: Bar usage more than once a month with a passenger.**
 - a. Library Used: Seaborn
 - b. Inference: Patrons visiting the bar more than 4 times tend to use less coupons.



4. **Name: Bar coupon usage across temperature variations**

a. Library Used: Seaborn and Matplotlib

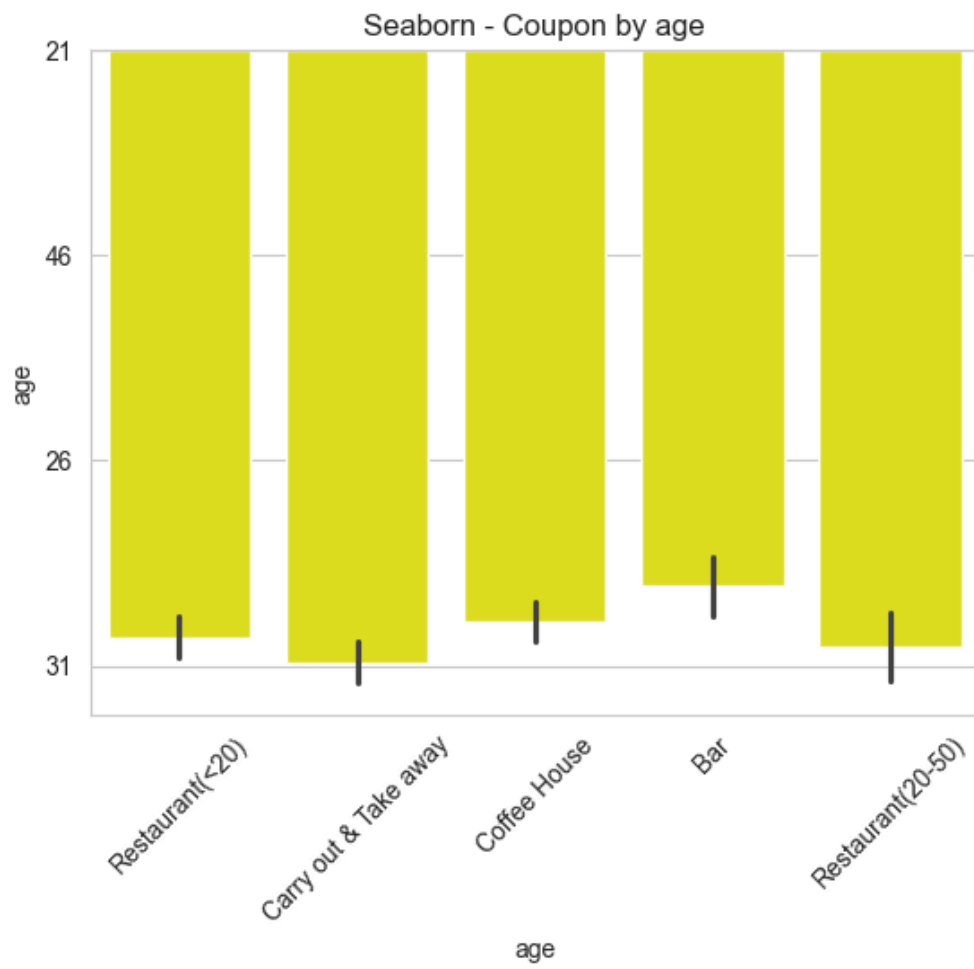
b. Inference: higher temperatures causes more visits and coupon usages at the bar.

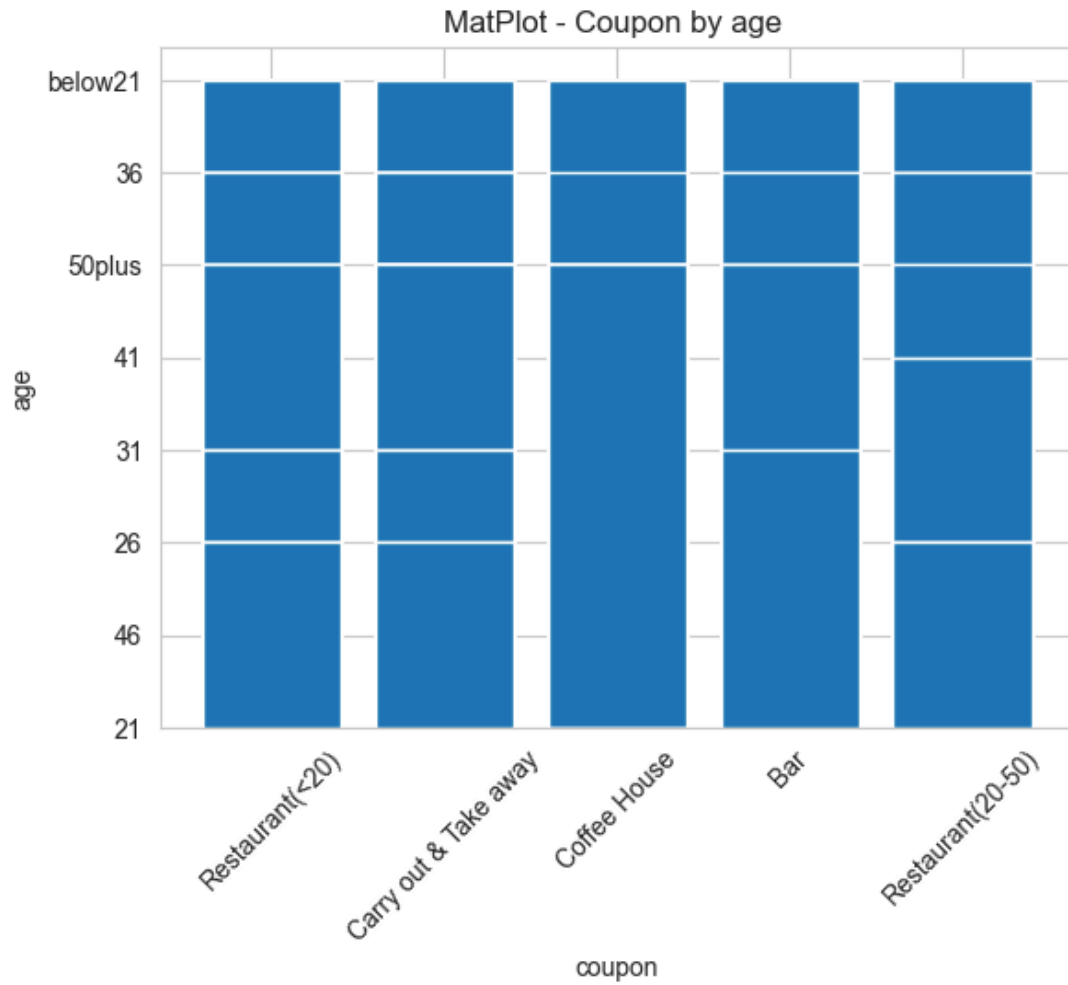


5. **Name: Bar coupon usage by age**

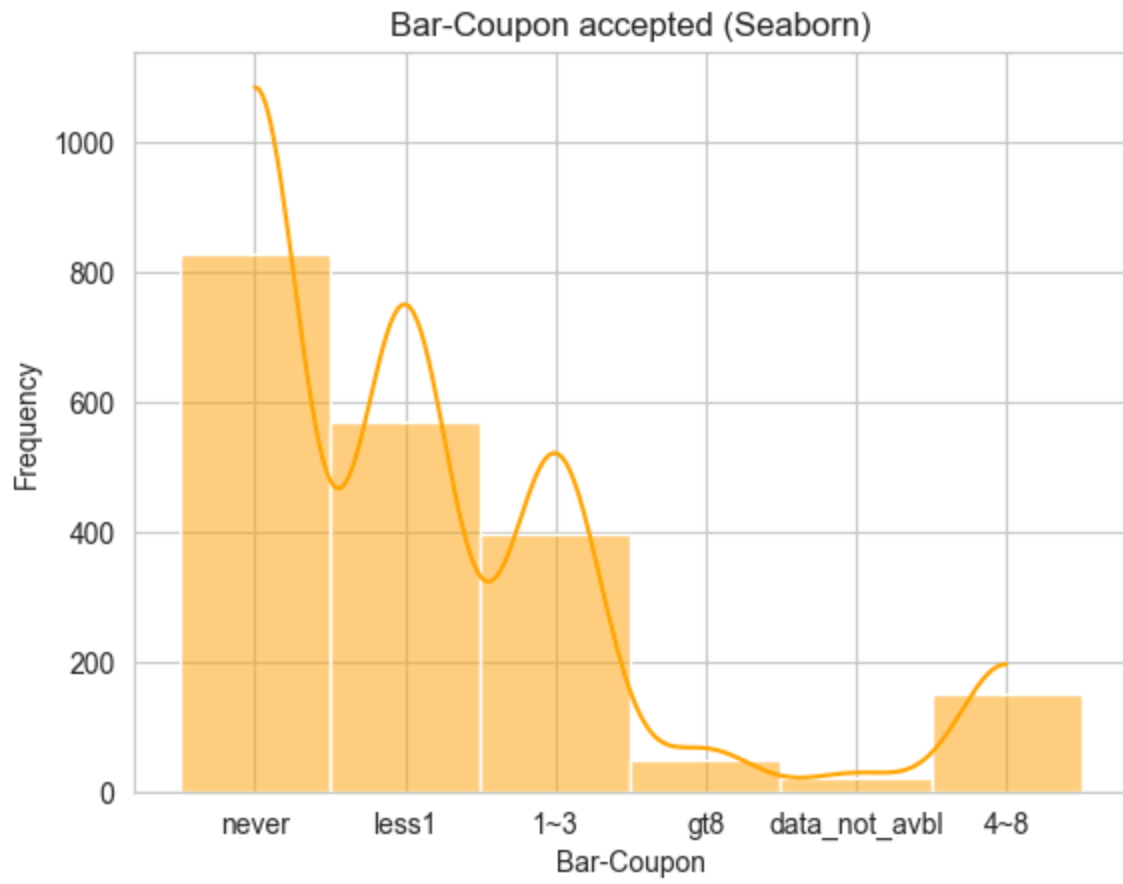
a. Library Used: Matplotlib and Seaborn

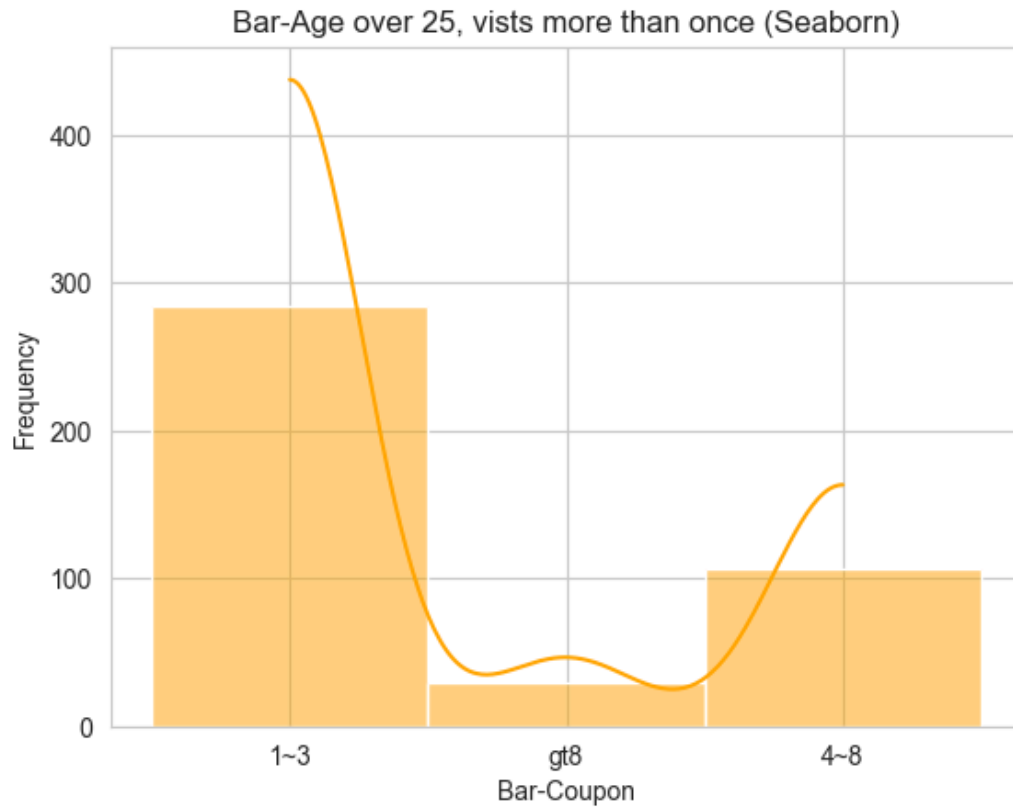
b. Inference: Ages 31 to 41 used more coupons.



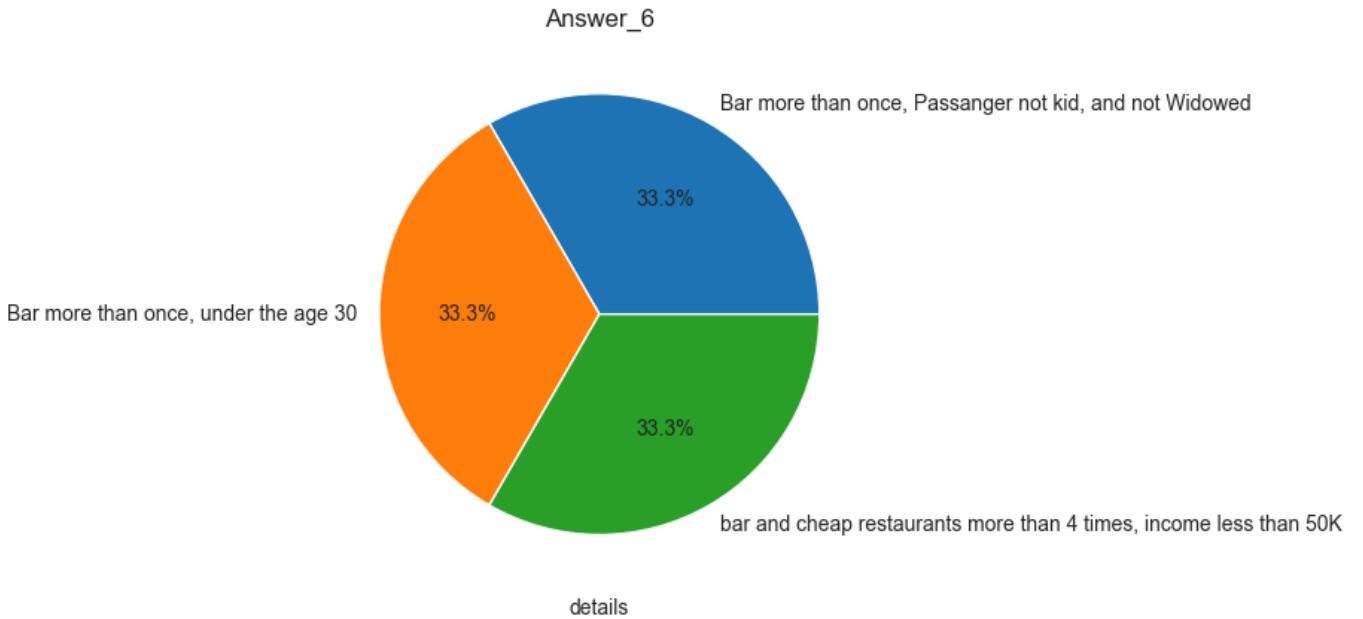


6. **Name: Bar coupon usage across number of visits**
 - a. Library Used: Seaborn
 - b. Inference: Frequent visitors use less coupons



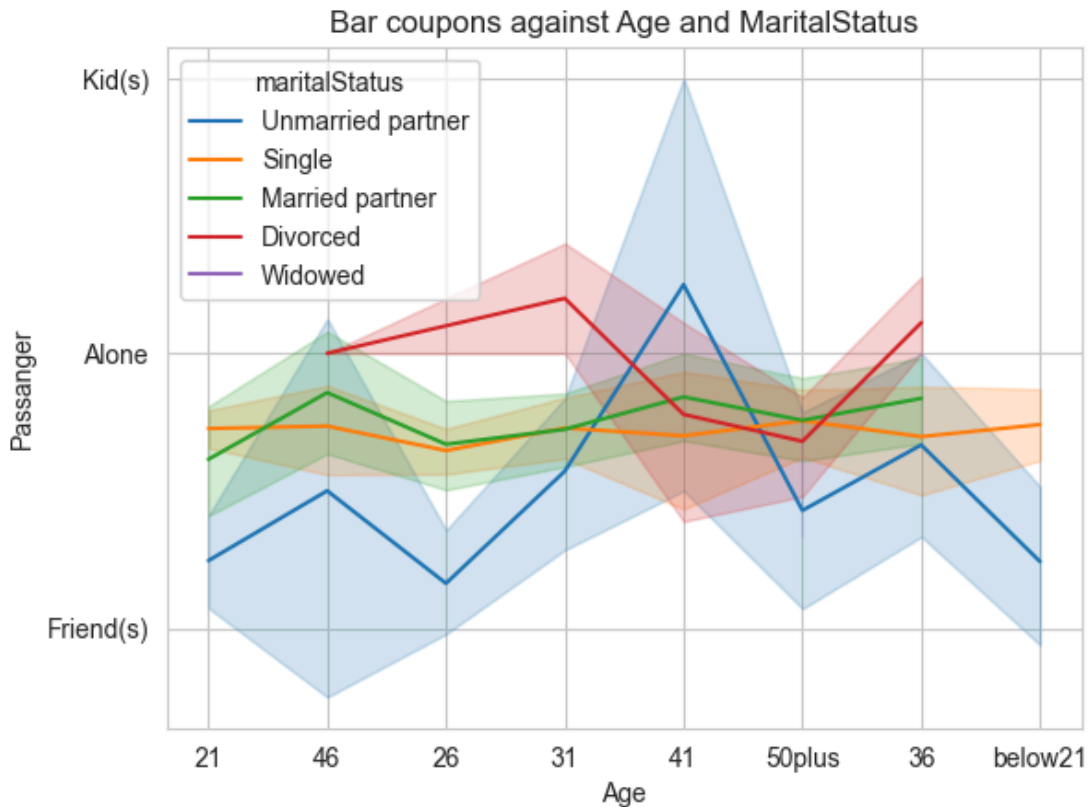


7. **Name: Bar coupon usage across number of visits & varying conditions specified in Question#6**
- a. Library Used: Matplotlib



8. **Name: Bar coupon usage across Age and Marital status**

- a. Library Used: Seaborn
- b. Inference: Divorced individuals and unmarried partners in the 31 to 46 age group show a higher propensity to use bar coupons.



Findings:

1. Problem Statement: Coupon Usage in the Bar Category

- Frequent visitors (more than four visits) exhibit lower coupon redemption rates, suggesting potential issues with coupon insufficiency, expiration/validity, or proximity.

2. Visualizations: Differences in Coupon Acceptance and Rejection

- Bar coupons constitute approximately 9% of all coupon categories offered.
- Unemployed individuals, students, and sales professionals collectively account for about 35% of all bar coupon redemptions.

3. Next Steps and Recommendations

- Increase the number of coupons available in the Bar category.
- Consider extending the validity period of bar coupons.